October-01-12 3:29:55 PM Item ID: D212-664-201TRN Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail Start Date: 01/10/2012 Start Oty: 1.00 **Cust Item ID: Required Date:** 16/10/2012 Req'd Oty: 1.00 **Customer:** Reference: Run Process Plan: MLJ Date: 12-10-0 \ Tooling: **Approvals:** Date: Stop QC: Date: SPC (Y/N): Date: Sequence ID/ Operation Tool ID Set Up/ Tool # Plan Accept Reject Reject Insp. **Work Center ID Description Run Hours** Code Qty Qty Number Stamp Draw Nbr **Revision Nbr** D212-664-241 Rev D 100 0.00 MORI SEIKI CNC LATHE LARGE \*100\* Mori Seiki 0.00 Memo Mori Seiki CNC Lathe Large 1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA114 2-Turn first side as per Folio FA114 3-Blend transition lines only, \*\*do not sand whole tube\*\*: FOLIO REV: AD DWG REV: \*Use mill bastard file, brush file repeatedly with file card. \*Do not use sandpaper coarser than 320 grit. 110 QC1- Inspect dimensions to dimension sheet 0.00 \*110\* QC 0.00 Memo Quality Control

90ml

DQA:	Date	e:	

NCR: Yes / No

# WORK ORDER NON-CONFORMANCE / UPDATE

									QA Closed:	Date:			
Work Orde	or.				DISPOSITION			AGAINST DE	PARTMENT	/PROCESS			
Part N	lo				Rework Scrap Use-as-is Work Order Update	Ther	Skid-tube  Machining  moforming  Large Fab	Crosstube Small Fab Finishing Composite	Il Fab Prod. Eng. Coor. Quality Shing Rec/Store/Packaging Other				
,,,						_ ]	. 0	٠ ـــ	J		·		
Root				Descr	iption of work order update	Initial	Α	ction	Sign &				
Cause	Date	Step	Qty		or Non-conformance	Chief En	g Des	cription	Date	Verification	QC Inspector		
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Fraining													
Jnapproved		l	LI		<u> </u>	AULT CAT	FGORY		<u> </u>				
Landin	g Gear				General	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
	Bending Centre Not Concentric to O/S Cracks Broken/Dan Crushed/Crimped Cuffs Heat Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion Turning Sequence Bend Bom/Route Bom/Route Broken/Dan Burrs Contaminatio Countersink Cut Too Shor Drill Holes Drawing Finish					Instruction Maint Mislate Misrea Offset Out of	tion Incomplete ctions Incomplete cenance celed ad	/Unclear	Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned V Power Loss/	ct issing Wrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other		
	Wave/Tw	ist in Tub	e	}	Folio	Outsid	e Dimensions						

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FOLIO REV: AD DWG REV: 3-Remove sand and plugs

4- scribe batch # and part # as per dwg

130 QC1- Inspect dimensions to dimension sheet 0.00

QC

0.00 Memo

Quality Control

1 \$ KE 12-10-04

Page 2

Insp.

Stamp

												DQA:	Date	e: _	
NCR:	Yes ,	/ No				WORK ORDER NON-O	O	NFOR	MANCE / UP	DATE					
												QA Closed:	Date	e:	······································
Work Orde	er.					DISPOSITION				AGAINST	DE	PARTMENT/	PROCESS		
Part N	Part No.  NCR No.					Rework Scrap Use-as-is Work Order Update	Scrap Machining Small Fall Use-as-is Thermoforming Finishin					Prod Rec/Stor	Engineering Quality Other		
												T		-	
Root						ption of work order update	ı	nitial		tion		Sign &	_		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Desc	ription		Date	Verification		QC Inspector
Doc/Data															
Equip/Tooling	Щ													ı	
Operator															
Material															
Setup															
Other		1													
Process														İ	
Supplier															
Training															
Unapproved															
						F	AUL	T CATE	GORY						
Landi	ng Ge	ar				General						_	_		
	Ве	ending			· [	Bend		Grain				Ovalized	. [		Pressure/Forced
	Ce	entre No	t Concer	tric to (	o/s	BOM/Route		Hardwa	re			Over/Under	tolerance		Temperature/Cure
	Centre Not Concentric to O/S BOM/Route Cracks Broken/Damaged							Inspecti	on Incomplete			Part Incorrec	t	١	Weld

Instructions Incomplete/Unclear

Maintenance

Out of Calibration

Out of Sequence

**Outside Dimensions** 

Mislabeled

Misread Offset Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Part Moved

Wrong Stock Pulled

Other

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Crushed/Crimped

Inspection Strip in Tube

Torque Waves in Extrusion

Cuffs

Heat Treat

Burrs

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

October-01-12 3:29:55 PM

Item ID: D212-664-201TRN Accept Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 01/10/2012 Start Oty: 1.00 Cust Item ID: **Required Date:** 16/10/2012 **Req'd Qty:** 1.00 **Customer:** Reference: Run Approvals: Process Plan: Date: **Tooling:** Date: Date: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Accept Reject Insp. Work Center ID Description **Run Hours** Code Qty Qty Number Stamp 140 QC8- Inspect parts - second check 0.00 \*140\* 12-10-4 QC 0.00 Memo Quality Control 145 0.00 \*145\* 12-10-4 Crosstubes 0.00 Memo Crosstubes GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY. 150 0.00 \*150\* RM 12-10-5 HandFXtube 0.00 Memo Hand Finishing Crosstubes 1- PRESSURE WASH X-TUBE INSIDE AND OUT

2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE

											DQA:	Dat	te:	
NCR:	res / <b>No</b>				WORK ORDER NON-C	ON	NFORI	MANCE / UP	DATE			_		
											QA Closed:	Dat	ιe:	
Work Orde	or:				DISPOSITION	ı			AGAINST	DE	PARTMENT/	PROCESS		
Work Orac	· I •				Rework	1		Skid-tube	Crosstube		]	Water Jet		Engineering
Part N	lo.				Scrap		1	Machining	Small Fab		Prod	d. Eng. Coor.	_	Quality
					Use-as-is			noforming	Finishing		<del>{</del>	e/Packaging		Other
NCR N	10.				Work Order Update			Large Fab	Composite			Supplier		
											•	•		·
Root				Descri	ption of work order update	ı	nitial	1	tion		Sign &			
Cause	Date	Step	Qty	C	or Non-conformance	Chi	ief Eng	Desc	ription		Date	Verification	<u>n</u>	QC Inspector
Doc/Data														
Equip/Tooling											:			
Operator								•					į	
Material					,									
Setup													i	
Other														
Process					•						!			
Supplier													,	
Training														
Unapproved														
					F/	AUL'	T CATE	GORY			<b></b>			
Landir	ng Gear				General				•		-	•		1
	Bending				Bend	Ш	Grain				Ovalized		<u>_</u>	Pressure/Forced
	Centre No	t Concer	ntric to (	o/s	BOM/Route		Hardwa	re			Over/Under	tolerance	L	Temperature/Cure
	Cracks Broken/Damaged						Inspecti	on Incomplete			Part Incorred	:t	L	Weld

Instructions Incomplete/Unclear

Maintenance

Out of Calibration

Out of Sequence

**Outside Dimensions** 

Mislabeled

Misread Offset Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Part Moved

Wrong Stock Pulled

Other

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Crushed/Crimped.

Inspection Strip in Tube

Torque Waves in Extrusion

Cuffs

Heat Treat

Burrs

Contamination Countersink

Cut Too Short

Drill Holes

Drawing

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October-01-12				*90.9	452*			•			Page 4	4
Item ID: Revision ID: Item Name:	D212-664-2			Accept	*N900	0040	1100	ገ* s	Setup Star	ΙΔ	S1*	
Start Date: Required Date: Reference:	01/10/2012	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item ! Customer:					IV	()/	
Approvals:		in:	Date:	Tooling: SPC (Y/N):		ate:	<u> </u>	R	Run Star Stop	1/1	R1* R2*	
Sequence ID/ Work Center II 160 *160*	D	Operation Description QC5- Inspect part comp	pleteness to step on W/O	Set Up/ Run Hours 0.00	Tool ID	Tool#	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp	2 10 0
QC Quality Control		Memo		0.00						•	8-89	
*170*		Packaging		0.00				- Da	1 /2	' ~ / / h =		
Packaging Packaging		Memo Identify and Location:	d stock in kanban rack	0.00					l	- 10	1	70
<sup>80</sup> *1ጸ∩*		QC21- Final Inspection	- Work Order Release	0.00					10	-110	111	0
QC Quality Control		Мето		0.00					<u> </u>	\m\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	F 2-10	05

										DQA:	Date:	
NCR:	Yes / No	)			WORK ORDER NON-O	OI	NFORM	MANCE / UPI	DATE	QA Closed:	Date:	
Work Orde	` <u> </u>				DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part N	No				Rework Scrap Use-as-is Work Order Update	Skid-tube Crosstube  Machining Small Fab  Thermoforming Finishing  Large Fab Composite			-}	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root		1		Descri	ption of work order update	П	nitial	Act	tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	1	ief Eng		ription	Date	Verification	QC Inspector
Doc/Data							J					
Equip/Tooling								}				
Operator			1									
Material												
Setup												
Other		ļ										
Process												
Supplier												
Training												
Unapproved								· 				<u> </u>
,					F	AUL	T CATE	GORY				
Landir	ng Gear			<b></b>	General				<b>r</b>	<b>-</b>		7
	Bendin	3			Bend	<u></u>	Grain			Ovalized		Pressure/Forced
	Centre	Not Conce	ntric to (	D/S	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	Cracks				Broken/Damaged		i '	on Incomplete		Part Incorre	ct	Weld
	Crushed	d/Crimped			Burrs		Instruct	ions Incomplete/U	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled
1	Cuffs				Contamination		Mainte			Part Moved		
	Heat Tr	eat			Countersink	Mislabeled			Positioned V		7	
	Inspection Strip in Tube Cut Too Short						Misread	ļ		Power Loss/	Surge	Other
	Ripples in Bend Drill Holes						Offset					
	Torque	Waves in l	Extrusior <b></b>	ո	Drawing		Out of C	Calibration				

Out of Sequence
Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Finish

Folio

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## **Picklist Print**

October-01-12 3:30:00 PM

Work Order ID: 90952

\*90952\*

Parent Item:

D212-664-201TRN

\*D212-664-201TRN\*

Parent Item Name: Crosstube Turning Detail

**Start Date:** 01/10/2012

**Required Date: 16/10/2012** 

mm. L 12/10/02

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A 08-03-06 new issue DD verified by:ec

IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Oty	Qty Issued	Date Issued	Status
D6006-129		Manufactured	No	<del></del>		120	Each	20.0000	1	1			
*D6006_12	Ω*								**	•			

170000-179

Crosstube Material

Location	Loc Qty	Loc Code	
LG	20		
23970	2		
26550	3		
34690	1		
(69838)	14		

Page 1

NCR: Y	es / No				WORK ORDER NON-	COI	NFOR	MANCE / UPI	DATE			
										QA Closed:	Date	2:
Work Orde	ne:				DISPOSITION				AGAINST DE	PARTMENT,	PROCESS	
Part N	lo				Rework Scrap Use-as-is Work Order Update		Thern	Skid-tube  Machining noforming  Large Fab	Crosstube Small Fab Finishing Composite	4 .	Water Jet d. Eng. Coor. e/Packaging Supplier	Engineering Quality Other
Root		<u> </u>	1 1	Descri	otion of work order update	T	Initial	Act	ion	Sign &		
Cause	Date	Step	Qty	•	or Non-conformance	- 1	nief Eng	. Descr	ription	Date	Verification	QC Inspector
Doc/Data					,							š .
Equip/Tooling												
Operator						1						
Material			1 1									
Setup [		ŀ					İ					
Other [			] ]									
Process		[	1					7				
Supplier												
Training						ļ						
Unapproved										<u> </u>		
					······	AUL	T CATE	GORY				
Landin	g Gear			_	General	_	1	•	_	7	_	<del></del> 1
[	Bending			<u> </u>	Bend	<u> </u>	Grain		<u> </u>	Ovalized	-	Pressure/Forced
	Centre N	ot Concer	ntric to O	/S	BOM/Route	_	Hardwa		<u> </u>	Over/Under	<u></u>	Temperature/Cure
	Cracks			-	Broken/Damaged	<u> </u>	-{ ·	on Incomplete	<u> </u>	Part Incorre		Weld
-	Crushed/	Crimped.			Burrs		-}	ions Incomplete/L	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	Cuffs				Contamination	<u></u>	Mainte			Part Moved		
-	Heat Trea			<u> </u>	Countersink	<u> </u>	Mislabe			Positioned V		<b></b>
	Inspectio		Tube		Cut Too Short		Misread	I	<u></u>	Power Loss/	Surge	Other
-	Ripples in				Drill Holes		Offset					
Ì	Torque W	/aves in E	xtrusion		Drawing		Out of 0	Calibration				

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

Folio

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DART AEROSPACE LTD	Work Order:	90952
Description: Crosstube Assembly (205/212 High Aft)	Part Number:	D212-664-241
Inspection Dwg: D212-664-241 Rev: D		Page 1 of 2

## FIRST ARTICLE INSPECTION CHECKLIST

	spection Sheet wing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	0.200	+/-0.010	200	_		VERN	CNG-08
	R0.063	+/-0.010	.263	//		RG	
	2.990	+0.005/-0.000	2.992			VERN	CNC-08
	5.237	+/-0.030	5.262.				
	2.600	+0.005/-0.000	2.604	/			
ار	2.686	+0.005/-0.000	2.689	//			
EA	2.770	+0.005/-0.000	2.775				
SIDE	2.854	+0.005/-0.000	2.859				
	2.938	+0.005/-0.000	2.943				
	3.021	+0.005/-0.000	3.622				
[	3.133	+0.005/-0.000	3.134				
	3.179	+0.005/-0.000	3.181			#	*
	0.200	./ 0.010					
}	<del></del>	+/-0.010	-200			VERN	CNC-08
}	R0.063	+/-0.010	.063	//		e6	
ļ	2.990	+0.005/-0.000	2,991	/_		VERN	CNC-03
	5.237	+/-0.030	5.256			<b>\</b>	
ŀ	2.600	+0.005/-0.000	2604				· <b>-</b>
ļ	2.686	+0.005/-0.000	2.689				
Ш	2.770	+0.005/-0.000	2.774				
SID	2.854	+0.005/-0.000	2.858				
8	2.938	+0.005/-0.000	2.943				
-	3.021	+0.005/-0.000	3.023				
	3.133	+0.005/-0.000	3.135				
	3.179	+0.005/-0.000	3.181			\psi_	V
	124.362	+/-0.020	124.362			tape	LG-22
F							

											DQA:	Da <sup>-</sup>	te:	
NCR:	Yes	/ No				WORK ORDER NON-C	O	NFORM	ANCE / UPDA	TE			•	
		•									QA Closed:	Da	te:	
Work Ord	er:		_			DISPOSITION			<del>2</del>	AGAINST DE	PARTMENT,	/PROCESS		
Part No.  NCR No.						Rework Scrap Use-as-is Work Order Update	Machining noforming	Crosstube Small Fab Finishing omposite	imall Fab Prod. Eng. Coor. Qua Finishing Rec/Store/Packaging Ot					
Root	1				Descri	ption of work order update	Ī	nitial	Action		Sign &			
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Descripti	ion	Date	Verificatio	n	QC Inspector
Doc/Data														
Equip/Tooling														
Operator						•								
Material								,						
Setup													ļ	
Other				·		and the second								
Process														
Supplier					3								1	
Training	П													
Unapproved	П													,
						F	AUL	T CATE	GORY					
Landi	ng Ge	ear				General	_			<del></del>	,			•
		Bending				Bend	Ш	Grain			Ovalized			Pressure/Forced
Centre Not Concentric to O/S BOM/Route						BOM/Route		Hardwa	re		Over/Under	tolerance		Temperature/Cure
	Cracks Broken/Damaged *						Ш	Inspecti	on Incomplete		Part Incorred	ct		Weld
	Crushed/Crimped Burrs					Burrs		Instruct	ons Incomplete/Uncl	ear	Part Lost/Mi	ssing		Wrong Stock Pulled
Cuffs Contamination					Contamination	Maintenance				Part Moved				
Heat Treat Countersink					Mislabeled			Positioned Wrong			_			
	Inspection Strip in Tube Cut Too Short						Misread			Power Loss/Surge			Other	

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

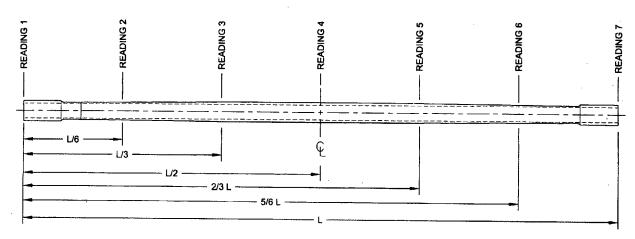
Finish

Folio

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DART AEROSPACE LTD	Work Order:	90952
Description: Crosstube Assembly (205/212 High Aft)	Part Number:	D212-664-241
Inspection Dwg: D212-664-241 Rev: D		Page 2 of 2

## WALL THICKNESS MEASUREMENT



Location WALL THICKNESS MEASUREMENT (IN) Deviation										
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE				
READING 1 L= 0"	. 391	. 383	. 386	.388	.008					
READING 2 L=	, 312.	.307.	.307	.310	,005					
READING 3 L=	477.	.478	.477.	.470	.001					
READING 4 L=	519	.522	.578	,579.	.004	0.062"				
READING 5 L=	.484	.475	.472.	.477	.012.					
READING 6	.318	. 310	302	.310	.016					
READING 7 L=	,399	.395	. 377.	,380	.022					

### **Calibration Result**

Actual Block Thickness: .250 - 1.00

Sitescan 250 Measured Thickness: .250 -1.00

Measured by:	Lc	Audited by:	TW	Preliminary Approval:	
Date:	12-10-04	Date:	12-10-4	Date:	

Rev	Date	Change	Revised by Approved
Α	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM
В	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM
С	07.05.08	Dwg Rev. updated	KJ/JLM
D	10.08.03	Dimension 124.362 was 124.36	KJ /O /A
E	12.06.04	Wall thickness form added	KJ 😽

NCR:	Yes ,	/ No				WORK ORDER NON-C	O	VFORM	MANCE / UPI	DATE		•		_ 	
											QA Clo	sed:	Da	te:	
Work Orde	or:					DISPOSITION				AGAINST DE	PARTM	ENT	/PROCESS		
	_					Rework			Skid-tube	Crosstube	]	_	Water Jet		Engineering
Part N	۱o. <u> </u>					Scrap			Machining	Small Fab	١,,,		d. Eng. Coor.	$\vdash\vdash$	Quality Other
NCR 1	No					Use-as-is Work Order Update			noforming Large Fab	Finishing Composite	] Rec	/Stor	re/Packaging Supplier	—	Other
Root					Descri	ption of work order update	ı	nitial	Act	ion	Sign	&			
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Descr	iption	Dat	e	Verification	n	QC Inspector
Doc/Data															
Equip/Tooling															
Operator	Ш										:				
Material	Ш								•						
Setup	Ш														
Other															
Process															
Supplier															
Training															
Unapproved			<u> </u>												
						F.	AUL	T CATE	GORY						
Landi	ng Ge	ar				General		1		_	7				İ
:	Шв	ending				Bend		Grain		<u></u>	Ovalize			$\square$	Pressure/Forced
	∐c	entre No	t Concer	ntric to	o/s	BOM/Route		Hardwa		<u> </u>			tolerance	$\sqcup$	Temperature/Cure
. •	Щc	racks				Broken/Damaged		i i	on Incomplete	L	Part Inc			$\vdash$	Weld
	c	rushed/C	rimped.			Burrs		ł	ions Incomplete/U	Jnclear	Part Lo	-	ssing		Wrong Stock Pulled
	c	uffs				Contamination		Mainte		_	Part M				•
	Шн	leat Treat	t			Countersink		Mislabe	led	<u></u>	Positio		_	_	•
	∐ Ir	rspection	Strip in	Tube		Cut Too Short		Misreac	I	L	Power	Loss/	Surge	$\Box$	Other
	l R	innles in	Rend		I	Drill Holes		Offset							

Out of Calibration

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

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Item	Qty -241	Qty -241B	Part Number	Description
1	Х		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		Х	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	_4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100 TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

С

В

1) MATERIAL: MANUFACTURED FROM D6006-129 FINISHED LENGTH = 124.362±0.020

CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

4) UNITS: INCHES UNLESS OTHERWISE NOTED.

BREAK SHARP EDGES: 0.005 TO 0.010 MAX.

IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.

WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664) D212-664-241B = 44.2 lbs (PER IIN-D212-664)

PART IS SYMMETRIC ABOUT CENTERLINE.

9) RUN CUTTER OFF PART, BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.

10) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.

11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE

14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOb CObA RETURN TO ENGINEERING UNCONTROLLED COPY SUBJECT TO AMENDMENT WITHOUT NOTICE

WORK ORDER ML5 NO. 9.09.52.

600 #11-614 11.07.26

DEO ATTACHED

REFORMAT/REVISE GENERAL NOTES/PART LIST: 09.09.30 REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3): RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE REMOVE -1009 ABRASION STRIP: ADD MAGNOBOND 07.03.08 6398, CUSHION, REVERSE CLAMPS ADD HOLES FOR COMPATABILITY WITH BHT/AA 05.02.04 SKIDTUBES A NEW ISSUE PH 00.12.12 REV. DESCRIPTION BY DATE DESIGN DART AEROSPACE LTD DRAWN HAWKESBURY, ONTARIO, CANADA RF CHECKED DRAWING NO. REV. D MFG, APPR. D212-664-241 SHEET 1 OF 4 APPROVED TITLE SCALE DE APPR. CROSSTUBE ASS'Y (205/212 HI AFT) NTS DATE COPYRIGHT © 2000 BY DART AEROSPACE LTD

09.09.30

											DQA:	Date:	
NCR: Y	'es /	/ No				WORK ORDER NON-	CONF	ORI	MANCE / UP	DATE	QA Closed:	Date:	
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Work Orde Part N						Rework Scrap	7		Skid-tube Machining	Crosstube Small Fab	Pro	Water Jet d. Eng. Coor.	Engineering Quality
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Landin	g Gea	ar				General							

Grain

Hardware

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Inspection Incomplete

Instructions Incomplete/Unclear

Bend

Burrs

BOM/Route

Contamination

Countersink

Cut Too Short Drill Holes

Drawing

Finish

Folio

Broken/Damaged

Pressure/Forced

Weld

Other

Temperature/Cure

Wrong Stock Pulled

Ovalized

Part Incorrect

Part Moved

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Over/Under tolerance

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Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Bending

Cracks

Cuffs

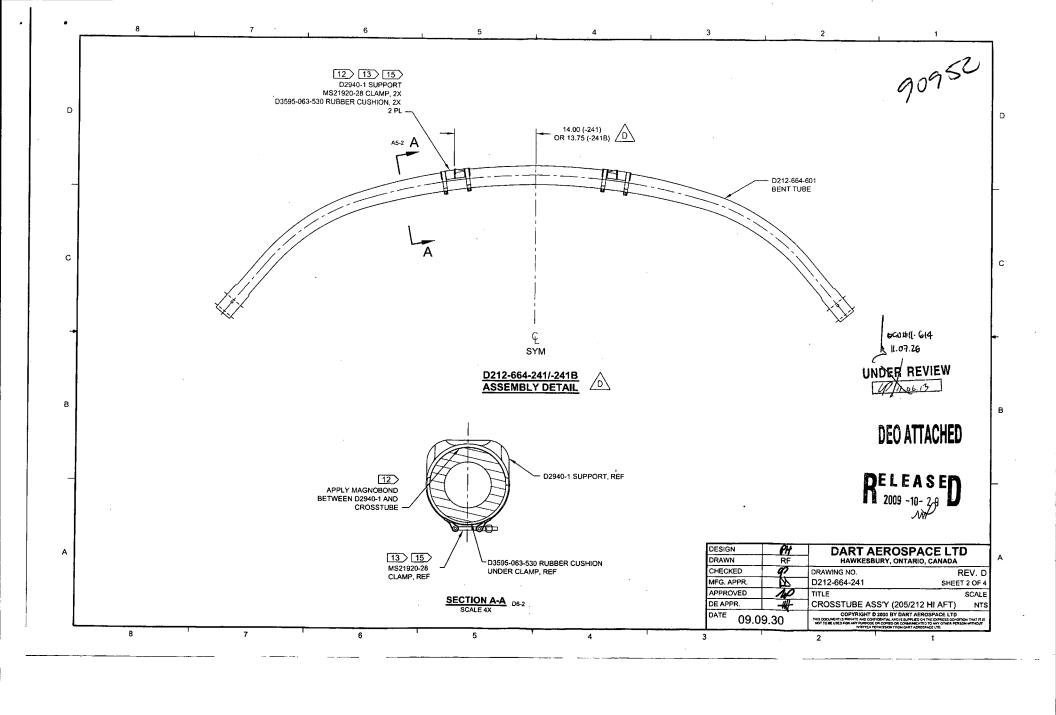
Heat Treat

Crushed/Crimped.

Inspection Strip in Tube

Torque Waves in Extrusion

Centre Not Concentric to O/S



											DQA:	Date	:
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											QA Closed:	Date	): 
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VVOIK OIU	C1				<del></del>	Rework	1		Skid-tube	Crosstube	1	Water Jet	Engineering
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						Use-as-is		Therm	noforming	Finishing	Rec/Stor	e/Packaging	Other
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Landi					<del></del>	General	_	7		<del></del>	7	F-	<b>-</b>
	_	ending			<u></u>	Bend	<u>_</u>	Grain		<u> </u>	Ovalized	_	Pressure/Forced
			t Concer	ntric to (	D/S	BOM/Route	<u>_</u>	Hardwa		<u> </u>	Over/Under	<u> </u>	Temperature/Cure
	—	racks				Broken/Damaged		-1	on Incomplete		Part Incorre	· -	Weld
			Crimped.			Burrs	<u></u>	4	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	_	uffs				Contamination		Mainte		<u> </u>	Part Moved		
	—	eat Trea			ļ	Countersink		Mislabe			Positioned V		$\neg$
	_		Strip in	Tube	<u></u>	Cut Too Short		Misread	!	L	Power Loss/	Surge	Other
	R	ipples in	Bend			Drill Holes	1	Offset					

Out of Calibration

Out of Sequence

Outside Dimensions

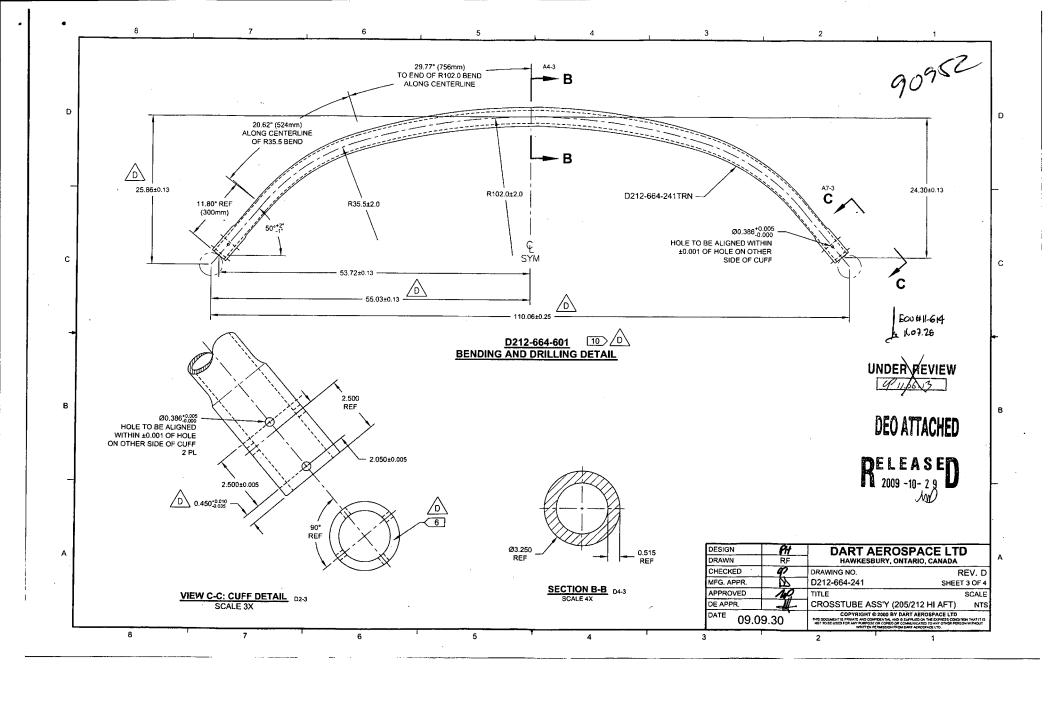
Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

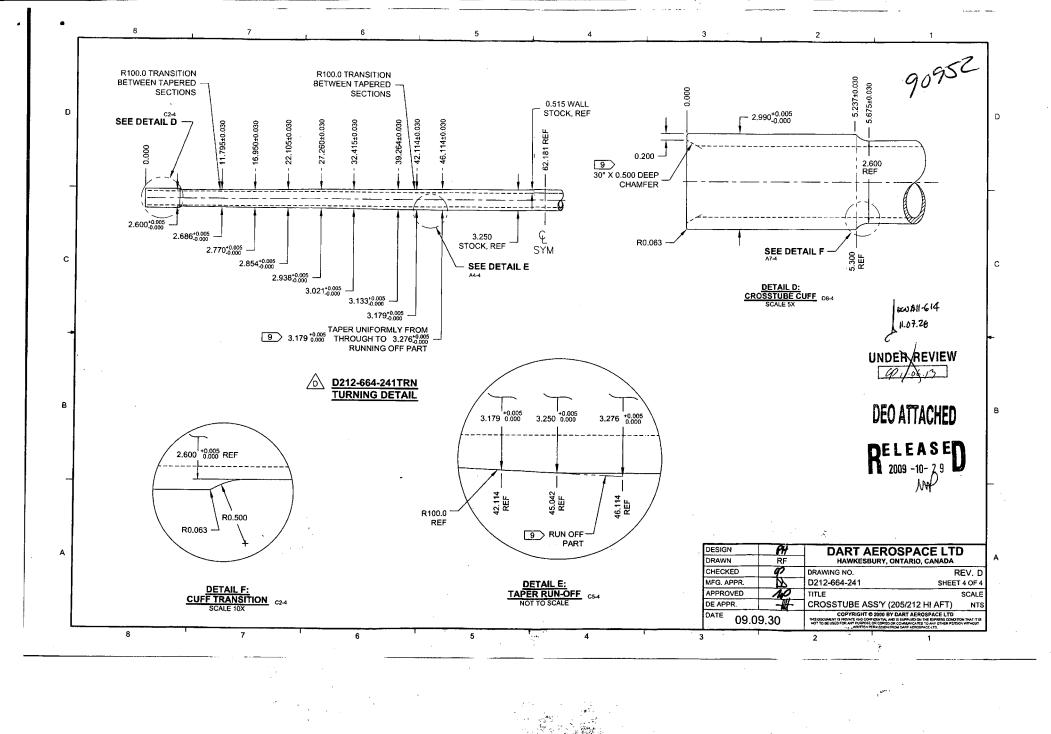


									DQA:	Date:	
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Work Order:					<b>DISPOSITION</b> Rework	1	Skid-tube	AGAINST DE		Water Jet	Engineering
Part No.					Scrap	1	Machining	Small Fab	•	d. Eng. Coor.	Quality
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		Crushed/Crim	oed.		Burrs		Instructions Incomplete/Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	i	Cuffs			Contamination		Maintenance	Part Moved		
		Heat Treat			Countersink		Mislabeled	Positioned W	/rong	
		Inspection Str	p in Tube		Cut Too Short		Misread	Power Loss/S	Surge	Other
		Ripples in Ben	d		Drill Holes		Offset	 		
		Torque Waves	in Extrusi	on	Drawing		Out of Calibration			
		Turning Seque	nce		Finish		Out of Sequence			
		Wave/Twist in	Tube		Folio		Outside Dimensions			

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Setup
Other
Process
Supplier
Training



NCR:	Yes / No				WORK ORDER NON-	COI	NFORM	MANCE / UPI	DATE			
										QA Closed:	Date:	
Work Orde	er.				DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
WOIK OIG					Rework	7		Skid-tube	Crosstube	1	Water Jet	Engineering
Part N	No.				Scrap	1 1		Machining	Small Fab	Pro	d. Eng. Coor.	Quality
					Use-as-is	1	Thern	noforming	Finishing	Rec/Sto	e/Packaging	Other
NCR N	۱o				Work Order Update	]		Large Fab	Composite	]	Supplier	
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Cause	Date	Step	Qty		or Non-conformance		ief Eng		ription	Date	Verification	QC Inspector
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ļ	Bending				Bend	Ш	Grain		<u> </u>	Ovalized		Pressure/Forced
ļ	Centre No	ot Concer	ntric to C	)/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	Cracks				Broken/Damaged		Inspecti	on Incomplete	_	Part Incorre	ct	Weld
	Crushed/	Crimped,			Burrs	Ш	Instruct	ions Incomplete/L	Jnclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	Cuffs				Contamination		Mainte	nance		Part Moved		
	Heat Trea	t			Countersink		Mislabe	led		Positioned V	Vrong	<b>-</b>
	Inspection	n Strip in	Tube		Cut Too Short		Misread	!		Power Loss/	Surge	Other
	Ripples in	Bend			Drill Holes		Offset					

Out of Calibration

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

Folio

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DRAWING NO.	TITLE	REV. D	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D212-664-241	CROSSTUBE ASSY (205/2	12 HI AFT)	<b>ENGINEERING ORDER</b>	D212-664-241-D-1	SHEET 1 OF,2	NTS
DRAWN	CHECKED	(N	MFG. APPR.	APPROVED MAP	DE APPR.	
DATE 11.04	.07 DATE	11.04.11	DATE /1.04.12	DATE 11/04/12	DATE 11-04.12	

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

<u>IS:</u>

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND

PAINT OUTSIDE PER DART QSI 005 4.2 REMOVE MASKING AND APPLY CLEAR COAT

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2

1 2011 -04- 18 D

UNDER REVIEW

BCVHI-GI4

11.07.28

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NCR:	res / No				WORK ORDER NON-CONFORMANCE / UPDATE									
										QA Closed:	Date:			
Work Orde	ar.				DISPOSITION				AGAINST DE	PARTMENT	/PROCESS			
WOIK OIG					Rework	7 ]		Skid-tube	Crosstube		Water Jet	Engineering		
Part N	10.				Scrap	1		Machining	Small Fab	Pro	d. Eng. Coor.	Quality		
				<del></del>	Use-as-is	1		noforming	Finishing	Rec/Sto	re/Packaging	Other		
NCR N	lo			<del></del>	Work Order Update	]		Large Fab	Composite	].	Supplier			
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	Bending			<u> </u>	Bend	L	Grain		<u></u>	Ovalized	<u> </u>	Pressure/Forced		
ļ	Centre N	ot Concer	ntric to C	)/s	BOM/Route		Hardwa			Over/Under	<u> </u>	Temperature/Cure		
	Cracks			<u> </u>	Broken/Damaged		1 '	on Incomplete		Part Incorre	<del></del>	Weld		
]	Crushed/	Crimped.		<u> </u>	Burrs		1	ions Incomplete/U	nclear	Part Lost/M	issing	Wrong Stock Pulled		
	Cuffs			L	Contamination	L	Mainte	nance	<u> </u>	Part Moved				
	Heat Trea	at		L	Countersink	L	Mislabe	led		Positioned V		7		
	Inspectio	n Strip in	Tube		Cut Too Short	L	Misread			Power Loss/	Surge	Other		
	Ripples in Bend				Drill Holes		Offset							

Out of Calibration
Out of Sequence

Outside Dimensions

DQA:

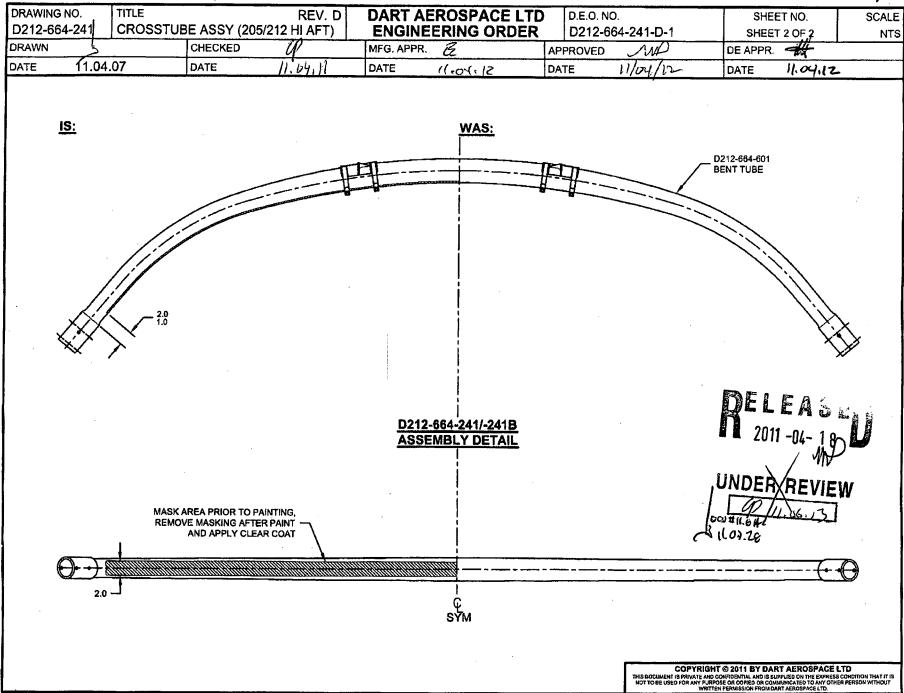
Date:

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing



				DQA:	Date:
NCR:	Yes /	No	WORK ORDER NON-CONFORMANCE / UPDATE		

										QA Closed:	Dat	:e:		
Work Orde	er:			·	DISPOSITION		AGAINST DEPARTMENT/PROCESS							
Part N					Rework Scrap		Skid-tube Crosstub  Machining Small Fa			ł	Water Jet d. Eng. Coor.	Engineering Quality		
NCR No.					Use-as-is Use-as-is Work Order Update	]   Th		oforming Large Fab	Finishing Composite	Rec/Stor	re/Packaging Supplier	Other		
Root				Descri	ption of work order update	Initia	al	Ad	ction	Sign &				
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Landir	ng Gear			_	General				_	1	r			
	Bending				Bend	Gra				Ovalized		Pressure/Forced		
	Centre No	ot Concer	ntric to	o/s	BOM/Route	$\vdash$	dwar			Over/Under		Temperature/Cure		
	Cracks				Broken/Damaged	⊢ `		on incomplete		Part Incorre	}	Weld		
	Crushed/Crimped. Cuffs Heat Treat			Burrs	_		ons Incomplete,	/Unclear	Part Lost/Mi	issing	Wrong Stock Pulled			
				Contamination	<del></del>		nance	<u> </u>	Part Moved					
1					Countersink	Mis	slabel	ed	<u> </u>	Positioned Wrong				
1	Inspection		Tube	<b></b>	Cut Too Short	$\vdash$	sread			Power Loss/	Surge	Other		
ļ	Ripples in				Drill Holes	Off								
	Torque W		xtrusio	י [_	Drawing	$\vdash$		alibration						
	Turning S	•			Finish	Out	t of S	equence						
	Wave/Twist in Tube				Folio	Out	Outside Dimensions							

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DRAWING NO.	TITLE	REV. D	DART AEF	ROSPACE LTD	D.E.O. NO.	SHEET	NO. SCALE
D212-664-241	CROSSTUBE ASS	S'Y (205/212 HI AFT)	ENGINEE	RING ORDER	D212-664-241-D	-2 SHEET 1	1 OF 1 NTS
DRAWN 9	CHECK	KED ASS	MFG. APPR.	/%	APPROVED A	DE APPR.	##
DATE 11.07.	.15 DATE	11.07.20	DATE /	17.07.21	DATE 11/2-7/2		11.07.21

**PURPOSE:** 

REPLACE MAGNOBOND WITH PROSEAL.

**CHANGE:** 

IS:

item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

### WAS:

ļ	7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023
İ					ADHESIVE (TEXTRON/BELL SPEC. 299-947-100,
					TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04° TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

### WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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NCR: Y	es / No				WORK ORDER NON-C	ONFORI	MANCE /	/ UPDATE	DQA:		
	·								QA Closed:	Date:	
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Work Order: Part No					Rework Scrap	Scrap Machining Sma			Pro	Engineering Quality Other	
NCR No.					Use-as-is Work Order Update	Therr	Thermoforming Finishing  Large Fab Composite			re/Packaging Supplier	Other
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Landing Gear				General			_	 •
ſ		Bending		Bend	Grain		Ovalized	Pressure/Forced
		Centre Not Concentric to O/S		BOM/Route	Hardware		Over/Under tolerance	Temperature/Cure
. [		Cracks		Broken/Damaged	Inspection Incomplete	L	Part Incorrect	Weld
		Crushed/Crimped.		Burrs	Instructions Incomplete/Unclear		Part Lost/Missing 🕝	Wrong Stock Pulled
		Cuffs	•	Contamination	Maintenance	L	Part Moved	
ſ		Heat Treat		Countersink	Mislabeled .		Positioned Wrong	 •
		Inspection Strip in Tube		Cut Too Short	Misread		Power Loss/Surge	Other
		Ripples in Bend		Drill Holes	Offset &			 ,
ſ	,	Torque Waves in Extrusion		Drawing	Out of Čalibration			 
. [		Turning Sequence		Finish	Out of Sequence			 
ſ		Wave/Twist in Tube		Folio	Outside Dimensions			